Surface Evaluation Guide

For

Gravel Roads

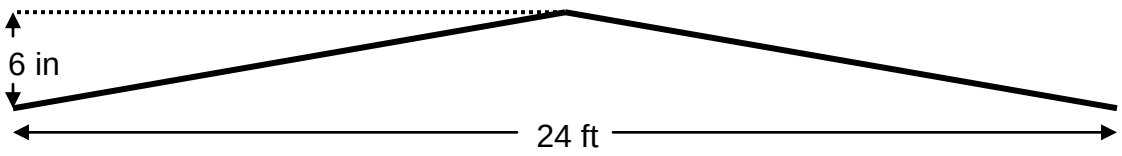
Prepared by SD Local Transportation Assistance Program

South Dakota State University
Box 2220 – Harding Hall
Brookings, SD 57007-0199
1-800-422-0129
sdltap@sdstate.edu

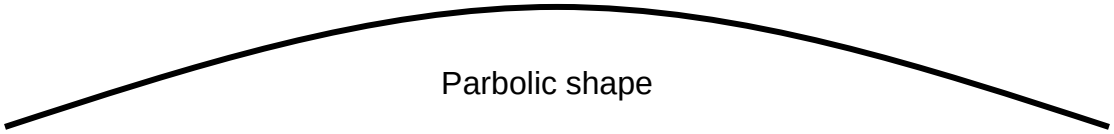
Purpose of Gravel Roadway Surface Evaluation Guide

This document is intended to be a helpful evaluation tool for managers and motorgrader operators to use in evaluating the geometric shape of unpaved roadways. It is not for rating the quality of surface gravel, but rather to evaluate the overall shape of the roadway. It should be recognized that certain distress on the surface of unpaved roads is due to poor quality gravel, not improper use of a Motorgrader. This guide follows closely the guidelines set forth in the FHWA Gravel Roads Manual published in 2005. Please refer to it for further information on surface gravel as well as more detailed information on shaping all parts of the roadway.

Roadway Crown



The crown in the road surface should be at or near 4%, or ½ in per ft drop on the cross slope each way from centerline. (See example above) In addition, the shape of crown should be a straight line from the centerline to the edge of roaway, not “rounded” or parabolic as shown below.



Evaluator’s comments:

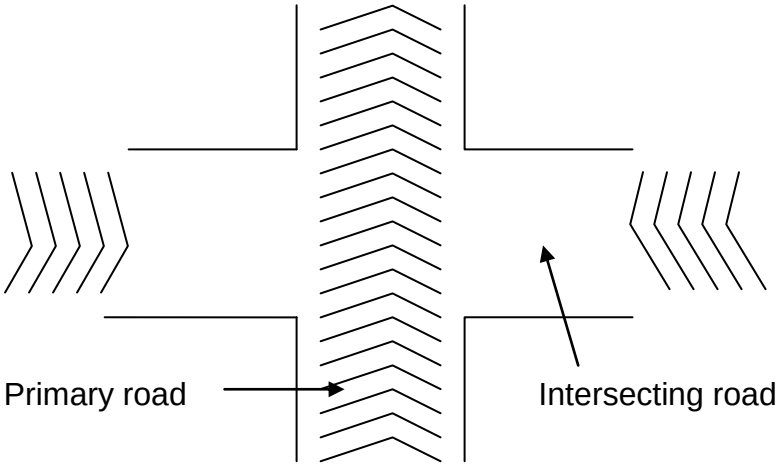
1. Is shape of crown straight or parabolic?
    a. Very straight _____ (less than one inch quarter crown)
    b. Slight deviation _____ (one to two inches quarter crown)
    c. Unacceptable _____ (greater than two inches quarter crown)

2. Percent of crown in roadway:
    a. Acceptable _____ (4% - plus or minus ½%)
    b. Marginal _____ (within 3 to 5%)
    c. Unacceptable _____ (greater than 5% or less than 3%)

3. General comments by evaluator:

_____
_____
_____
_____
_____
_____
_____

Shape of controlled intersections.



The primary road should retain crown through the intersection since traffic passing through on this road does not have to slow or stop. The intersecting road(s) which are controlled by stop signs should be shaped to match the edge of the primary road. Approximately 50 to 100 ft back, begin to take the crown out of the intersecting roads to match the primary road.

Evaluator's comments:

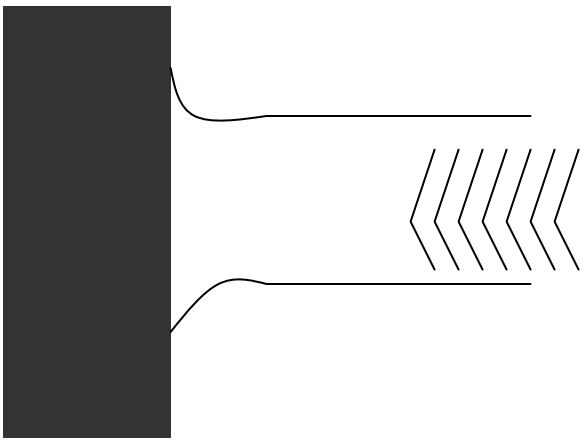
1. Shape of crown on primary road:
    a. Is maintained right on through intersection _____ (excellent)
    b. Some deviation from normal crown _____ (reshape)
    c. Great deviation from normal crown _____ (reshape as soon as possible)

2. Overall shape of intersection:
    a. Intersecting roads match primary road well _____ (excellent)
    b. Short transition in matching roadways _____ (reshape)
    c. Abrupt transition at edge of primary road _____ (reshape as soon as possible)

General Comments:

_____
_____
_____
_____

Intersections with Paved Roads



The gravel road should match the edge of the paved road. The crown in the gravel road should be gradually eliminated starting 50 to 150 ft back to make a smooth transition onto the paved road.

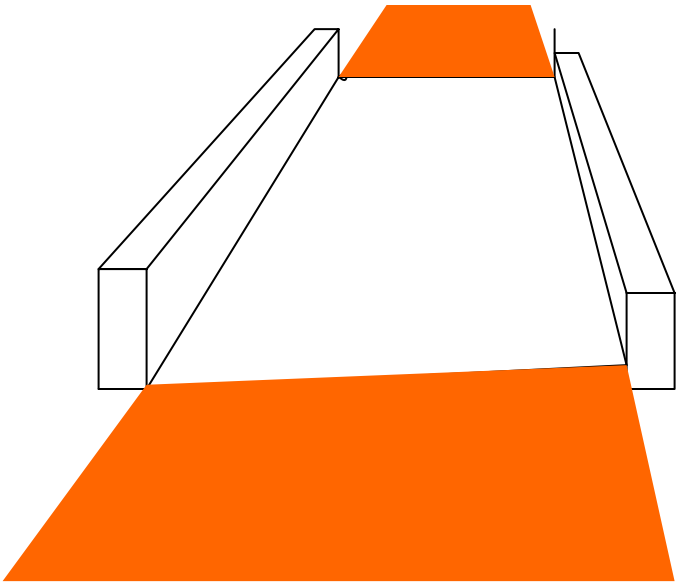
Evaluator's comments:

1. Smoothness of gravel and pavement joint:
    a. Matches very well _____ (no problems)
    b. Some roughness, gravel too high or too low _____ (reshape)
    c. Excess roughness, potholes at edge of pavement and/or gravel pushed out onto pavement: _____ (reshape immediately)
2. Shape of gravel road near intersection:
    a. Gradual elimination of crown _____ (excellent shape)
    b. Transition out of crown made too close to intersection _____
    c. Abrupt change of crown very near pavement edge _____ (not acceptable, reshape soon)

General Comments:

_____
_____
_____
_____
_____

Gravel Road Approaches to Bridges



Gravel road should match the elevation and profile of the edge of the bridge deck. Surface gravel should not be dragged unto to bridge deck, not should potholes be found due to gravel not being brought up to edge of deck.

Evaluator's comments:

1. Smoothness of gravel and deck joint:
    a. Very smooth transition _____ (excellent shape)
    b. Somewhat rough, gravel too high or too low _____ (material needs to be removed from or brought up to edge of deck)
    c. Very rough, potholes or excess gravel at edge of deck _____ (reshape immediately)
    d. Too much material placed across bridge deck _____ (this is not acceptable, but should be changed with supervisor's input)

2. Condition of roadway approach:
    a. Smooth transition from normal crown to match deck _____ (excellent)
    b. Transition made too quickly from normal crown _____ (reshape)
    c. Abrupt transition which causes rough ride, could cause loss of control by driver of vehicle _____ (reshape immediately)

General :Comments:

_____

_____

_____

Gravel Road Rail Crossings

The gravel road should match the edge of the planks or other structure at the crossing. No gravel should be spilled into the rail flange ways. Approximately 50 to 150 ft back from crossing, the crown should gradually be eliminated to match the crossing.

Evaluator's comments:

1. Gravel road matches crossing:
    a. Excellent, smooth crossing _____
    b. Somewhat rough with too much or too little gravel placed at edge of crossing _____ (reshape)
    c. Rough crossing with potholes or bumps _____ (reshape immediately)

2. Flange way condition:
    a. No gravel present in flangeway _____ (excellent)
    b. Some material observed in flangeway _____ (clean)
    c. Flangeway partially or nearly filled _____ (note this is a dangerous condition and could cause derailment. Clean immediately after notifying railroad and with their permission)

General Comments: _____
_____

Superelevation in Curves

The gravel roadway should have a gradual transition from normal crowned surface on a straight section of roadway to a superelevated shape in curves. Superelevation generally should not exceed 8% or one inch per foot on the cross slope.

Evaluator's comments:

1. Shape of superelevation:
    a. Superelevation exists with good transitions _____ (excellent)
    b. Superelevation is not even _____ (reshape)
    c. Superelevation is not present or excessive _____ (reshape immediately)

General comments:

_____
_____
_____
_____
_____

Road Shoulder

The shoulder of the gravel road should slope directly from the edge of the traveled way to the ditch. No berm or secondary ditch should be present to obstruct drainage from the roadway.

Evaluator's comments:

1. Shape of shoulder:
    a. Shoulder slopes directly from edge of roadway to ditch – excellent
    b. There is slight berm at edge of roadway – 1-3 inches – reshape in spring.
    c. There is severe berm at edge of roadway – 4 inches or greater – try to reshape as soon as possible.